

## ABSTRACT

A low-volatility or non-volatility memory device utilizing zero field splitting properties to store data. In response to an electrical pulse or a light pulse, in the absence of any externally applied magnetic field, the host material can switch between stable energy-absorbing states based on the zero field splitting properties of the metal ions and the surrounding host material. The invention also includes a device and method for the storage of multiple bits in a single cell using a plurality of metal ion species in a single host material.